

CLAIMS

What is claimed is:

1. A respiratory pressure sensing system, comprising:
a pneumotach configured to be positioned along a respiratory conduit; and
a pressure transducer configured to be removably coupled with said pneumotach, said pressure transducer including at least one pressure sensor for receiving a respiratory sample when said pressure transducer and said pneumotach are coupled with one another and said pneumotach is positioned along the respiratory conduit.
2. The respiratory pressure sensing system of claim 1, wherein said pneumotach includes:
a primary conduit positionable along a pathway of the respiratory conduit;
an obstruction positioned across a portion of said primary conduit; and
at least two pressure ports in communication with said primary conduit and positioned with at least a portion of said obstruction therebetween.
3. The respiratory pressure sensing system of claim 2, wherein said pressure transducer further includes:
at least two sample conduits configured to removably couple and communicate with corresponding pressure ports of said at least two pressure ports.
4. The respiratory pressure sensing system of claim 3, wherein said at least one pressure sensor comprises a differential pressure sensor in communication with said at least two sample conduits.
5. The respiratory pressure sensing system of claim 4, wherein said pressure transducer further includes:
at least another pressure sensor in communication with an environment external to said pressure transducer.

6. The respiratory pressure sensing system of claim 5, wherein said at least another pressure sensor comprises a differential flow pressure which also communicates with at least one of said at least two sample conduits.
7. The respiratory pressure sensing system of claim 3, wherein each of said at least two pressure ports includes an opening and said pressure transducer further includes a sealing member comprising resealable material covering said opening.
8. The respiratory pressure sensing system of claim 7, wherein said sealing member comprises a film positioned over said opening.
9. The respiratory pressure sensing system of claim 7, wherein said resealable material comprises at least one of latex and silicone.
10. The respiratory pressure sensing system of claim 7, wherein each of said at least two sample conduits comprises a piercing member configured to pierce said sealing member of a corresponding sample conduit.
11. The respiratory pressure sensing system of claim 10, wherein said piercing member comprises a hollow needle.
12. The respiratory pressure sensing system of claim 10, wherein an outer dimension of said piercing element is greater than an inner dimension of said corresponding sample conduit.
13. The respiratory pressure sensing system of claim 3, further comprising a valve positioned along each of said at least two sample conduits.
14. The respiratory pressure sensing system of claim 13, wherein each said valve is configured to control flow of a sample of respiratory gases to said at least one pressure sensor.

15. The respiratory pressure sensing system of claim 1, further comprising:
a monitor in communication with said at least one pressure sensor, said monitor configured to calculate at least one of a respiratory pressure parameter, a respiratory flow parameter, a respiratory volume parameter, a blood gas parameter, and a blood flow parameter based at least partially on a signal from said at least one pressure sensor.
16. An airway adapter, comprising:
first and second ends configured to be coupled to respective portions of a respiratory conduit;
and
a pneumotach between said first and second ends and including:
a primary conduit positioned along a pathway of said respiratory conduit;
an obstruction positioned to partially block flow of gases through said primary conduit;
and
at least two pressure ports positioned with at least a portion of said obstruction therebetween, said at least two pressure ports being configured to removably receive corresponding features of a portable pressure transducer.
17. The airway adapter of claim 16, wherein said pneumotach includes sealing elements across openings of said at least two pressure ports.
18. The airway adapter of claim 17, wherein said sealing elements are configured to receive and seal against outer surfaces of piercing members of said portable pressure transducer.
19. The airway adapter of claim 18, wherein said sealing elements are further configured to substantially reseal upon removal of said piercing members therefrom.
20. The airway adapter of claim 17, wherein each of said sealing elements comprises a soft, resilient elastomeric material.

21. The airway adapter of claim 20, wherein said soft, resilient elastomeric material comprises at least one of latex and silicone.

22. The airway adapter of claim 16, wherein each pressure port of said at least two pressure ports comprises a hollow piercing member.

23. The airway adapter of claim 16, wherein each pressure port of said at least two pressure ports is configured to matingly engage said corresponding feature of said portable pressure transducer.

24. The airway adapter of claim 16, further comprising at least one material sensing element.

25. The airway adapter of claim 24, wherein said at least one material sensing element comprises an infrared type sensing element.

26. The airway adapter of claim 25, wherein said infrared type sensing element comprises a pair of windows positioned at opposite sides of said primary conduit.

27. The airway adapter of claim 24, wherein said at least one material sensing element comprises a luminescence-quenching type sensing element.

28. The airway adapter of claim 27, wherein said luminescence-quenching type sensing comprises at least one window and a luminescable material exposed through said at least one window.

29. The airway adapter of claim 24, further comprising:
a seating element to ensure proper orientation of a complementarily configured transducer relative upon coupling thereof with the airway adapter.

30. A transducer of a pressure sensing system, comprising:
a housing configured to be carried upon a respiratory conduit;
at least one sample conduit at least partially within said housing and configured to communicate with the respiratory conduit; and
at least one pressure sensor within said housing and in flow communication with said at least one sample conduit.

31. The transducer of claim 30, wherein the at least one sample conduit comprises at least two sample conduits configured to be removably coupled with corresponding features of an airway adapter positioned along the respiratory conduit.

32. The transducer of claim 31, wherein said at least one pressure sensor communicates with each of said at least two sample conduits.

33. The transducer of claim 32, wherein said at least one pressure sensor comprises a differential pressure sensor.

34. The transducer of claim 31, wherein each of said at least two sample conduits comprises a piercing member for piercing a corresponding feature of said airway adapter.

35. The transducer of claim 31, wherein each of said at least two sample conduits comprises a coupling end configured to matingly engage a corresponding feature of said airway adapter.

36. The transducer of claim 31, wherein each of said at least two sample conduits comprises a coupling end configured to be pierced by and seal against a corresponding feature of said airway adapter.

37. The transducer of claim 30, further comprising a gauge pressure sensor in communication with an environment external to said housing.

38. The transducer of claim 37, wherein said baseline pressure sensor comprises a differential pressure sensor.

39. A method for monitoring at least a pressure of an individual's respiration, comprising:
positioning an airway adapter comprising a pneumotach along a respiratory conduit configured for communication with the individual's airway; and
assembling a pressure transducer substantially directly with at least said pneumotach.

40. The method of claim 39, wherein said assembling comprises aligning and temporarily establishing communication between coupling ends of sample conduits of said pressure transducer with corresponding pressure ports of said pneumotach.

41. The method of claim 40, wherein said temporarily establishing comprises introducing said coupling ends through sealing elements associated with said corresponding pressure ports.

42. The method of claim 40, wherein said temporarily establishing comprises piercing sealing elements associated with said coupling ends with said corresponding pressure ports.

43. The method of claim 40, wherein said temporarily establishing comprises matingly engaging said coupling ends and said corresponding pressure ports.

44. The method of claim 40, wherein said temporarily establishing comprises establishing communication that will withstand a pressure of up to about 150 mm Hg.

45. The method of claim 39, further comprising:
evaluating a respiratory sample to determine a pressure thereof.

46. The method of claim 45, wherein said evaluating comprises evaluating a pressure differential.

47. The method of claim 45, further comprising:
establishing a baseline pressure.

48. The method of claim 45, further comprising:
transmitting a signal representative of said pressure from said pressure transducer to a monitor.

49. The method of claim 48, further comprising:
calculating at least one of a respiratory pressure parameter, a respiratory flow parameter, a respiratory volume parameter, a blood gas parameter, and a blood flow parameter.

50. The method of claim 39, further comprising:
disassembling said pressure transducer from said pneumotach.